

Patent Claims

1. An artificial lens (10) for an eye, which is **characterized in that** it has two or more media (12, 13) that are flexible in shape that come into direct contact with one another as lens elements.
2. The artificial lens according to claim 1, further characterized in that the at least two media (12, 13) that are flexible in shape are disposed in an uptake container (11) forming a lens body.
3. The artificial lens according to claim 1 or 2, further characterized in that the latter is formed in a suitable manner for accommodation.
4. The artificial lens according to one of claims 1 to 3, further characterized in that it has a defined, pre-adjusted refractive power.
5. The artificial lens according to one of claims 1 to 4, further characterized in that it has a defined dynamic range of refractive power, and that the dynamic range preferably comprises at least 1.5 diopters, more preferably at least 2.5 diopters, and particularly preferred, at least 4 diopters.
6. The artificial lens according to one of claims 1 to 5, further characterized in that the media (12, 13) that are flexible in shape contact at least one interface (14) and are disposed so that they can be displaced relative to one another.
7. The artificial lens according to one of claims 1 to 6, further characterized in that at least two media (12, 13) that are flexible in shape are provided in an uptake container (11) forming a lens body, and that the media (12, 13) are fixed in space in uptake container (11).
8. The artificial lens according to one of claims 1 to 7, further characterized in that the media

(12, 13) come into contact on at least one interface (14) and that means (23) for changing the size and/or shape of the interface(s) (14) are provided between the media (12, 13).

9. The artificial lens according to one of claims 1 to 8, further characterized in that a control device is provided for controlling the artificial lens (10).

10. The artificial lens according to one of claims 1 to 9, further characterized in that the media (12, 13) that are flexible in shape cannot be mixed.

11. The artificial lens according to one of claims 2 to 10, further characterized in that at least one boundary of the uptake container (11) has at least one arched contour, at least in regions.

12. The artificial lens according to one of claims 2 to 11, further characterized in that one or more boundaries of the uptake container (11) is/are made transparent, at least in regions.

13. The artificial lens according to one of claims 2 to 12, further characterized in that one or more boundaries (15) of the uptake container (11) are made of a flexible material, at least in regions

14. The artificial lens according to one of claims 1 to 13, further characterized in that at least one of the media (12, 13) that are flexible in shape is made transparent, at least in regions.

15. The artificial lens according to one of claims 1 to 14, further characterized in that at least one medium (12, 13) that is flexible in shape is applied to at least one bearing surface (22), at least in regions.

16. The artificial lens according to one of claims 1 to 15, further characterized in that the media (12, 13) that are flexible in shape are formed as a liquid or a type of gel.

17. The artificial lens according to one of claims 1 to 16, further characterized in that at least one of the media (12, 13) that are flexible in shape is made in the form of one or more drops.

18. The artificial lens according to one of claims 1 to 17, further characterized in that the media (12, 13) that are flexible in shape have the same or approximately the same density.

19. The artificial lens according to claim 18, further characterized in that the media (12, 13) that are flexible in shape have the same or approximately the same density in a specific temperature range and that the temperature range may lie preferably between 30 °C and 45 °C, more preferably between 35 °C and 40 °C, and particularly preferred between 36 °C and 38 °C.

20. The artificial lens according to one of claims 1 to 19, further characterized in that at least two of the media (12, 13) that are flexible in shape have different optical properties, in particular, different refractive numbers.

21. The artificial lens according to one of claims 7 to 20, further characterized in that one medium (13) that is flexible in shape is displaced or can be displaced in the direction of another medium (12) that is flexible in shape each time via the means (23) for changing the interface(s) (14) in such a way that the curvature of at least one interface (14) between the two media (12, 13) that are flexible in shape is altered.

22. The artificial lens according to one of claims 7 to 21, further characterized in that the means (23) for changing the interface(s) can be disposed annularly around a clear opening (28).

23. The artificial lens according to claim 22, further characterized in that the clear opening (28) at least corresponds to the maximum pupil diameter of the eye for which the artificial lens (10) is specified.

24. The artificial lens according to one of claims 7 to 23, further characterized in that the means (23) for changing the size and/or shape of the interface(s) between the media (12, 13) that are flexible in shape are formed on the basis of electrowetting.

25. The artificial lens according to claim 24, further characterized in that a first medium (12) that is flexible in shape and a second medium (13) that is flexible in shape have a different electrical conductivity, that the medium (12) that is flexible in shape and has the smaller electrical conductivity is disposed between the medium (13) that is flexible in shape and has the greater electrical conductivity and at least one electrode, and that by applying an electrical field between the at least one electrode and the medium (13) that is flexible in shape and has the greater electrical conductivity, the interface between the two media (12, 13) that are flexible in shape is changed or can be changed.

26. The artificial lens according to one of claims 7 to 23, further characterized in that the means (23) for changing the interface(s) are designed so as to act on at least one (13) of the media that are flexible in shape, the means (23) for changing the interface(s) are designed so as to produce a pressure on at least one (13) of the media that are flexible in shape, and that a medium (13) that is flexible in shape is or can be displaced each time, and in particular, pressed, via this means (23), at least at an interface (14) in at least one preferred direction, in the direction of another medium (12) that is flexible in shape.

27. The artificial lens according to one of claims 7 to 23, further characterized in that at least one medium that is flexible in shape is surrounded on all sides by another medium that is flexible in shape, that the means (23) for changing the interface(s) are designed so as to act on at least one of the media that are flexible in shape, and that the means (23) for changing the interface(s) are designed for producing a pressure on at least one of the media that are flexible in shape.

28. The artificial lens according to claim 26 or 27, further characterized in that the means (23) for changing the interface(s) are formed as a mechanical means.

29. The artificial lens according to claim 28, further characterized in that the mechanical means (23) are formed as a piston device, a stamping device or a cylinder device.

30. The artificial lens according to one of claims 26 to 29, further characterized in that the means (23) for changing the interface(s) are designed in the form of at least one controllable membrane (24).

31. The artificial lens according to one of claims 2 to 30, further characterized in that the fixation in space of the media (12, 13) that are flexible in shape inside uptake container (11) is provided by fastening means.

32. The artificial lens according to claim 31, further characterized in that the fastening means are designed in the form of one or more different surface coating(s) inside the uptake container (11) and/or in the form of a geometric configuration at least of regions of the uptake container (11).

33. The artificial lens according to one of claims 1 to 32, further characterized in that means for stabilizing (stabilization means) the surface structure of at least one of the media (12, 13) that are flexible in shape are provided.

34. The artificial lens according to claim 33, further characterized in that the stabilization means are provided at least in the region of the interface(s) (14) between two media (12, 13) that are flexible in shape.